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AN ELECTRICALLY SMALL DIELECTRIC ANTENNA WITH WIDE BANDWIDTH

The present invention relates to a dielectric antenna having a feed and a groundplane having an aperture, the dielectric antenna having wide bandwidth.

Dielectric antennas are devices that radiate or receive radio waves at a chosen frequency of transmission and reception, as used in for example in mobile telecommunications. In general, a dielectric antenna consists of a volume of a dielectric material disposed on or close to a grounded substrate, with energy being transferred to and from the dielectric material by way of monopole probes inserted into the dielectric material or by way of monopole aperture feeds provided in the grounded substrate (an aperture feed is a discontinuity, generally rectangular in shape, although oval, oblong, trapezoidal 'H' shape, '<->' shape, or butterfly/bow tie shapes and combinations of these shapes may also be appropriate, provided in the grounded substrate where this is covered by the dielectric material. The aperture feed may be excited by a strip feed in the form of a microstrip transmission line, grounded or ungrounded coplanar transmission line, triplate, slotline or the like which is located on a side of the grounded substrate remote from the dielectric material). Direct connection to and excitation by a microstrip transmission line is also possible. Alternatively, dipole probes may be inserted into the dielectric material, in which case a grounded substrate may not be required. By providing multiple feeds and exciting these sequentially or in various combinations, a continuously or incrementally steerable beam or beams may be formed, as discussed for example in the present applicant's co-pending US patent application serial number US 09/431,548, now US 6,452,565 and the publication by KINGSLEY, S.P. and O'KEEFE, S.G., "Beam steering and monopulse processing of probe-fed dielectric resonator antennas", IEE Proceedings - Radar Sonar and Navigation, 146, 3, 121 - 125, 1999, the full contents of which are hereby incorporated into the present application by reference.

T.H.

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